Critical Analysis Team Report

CAT Report #24

30 November 2001

The Critical Analysis Team (CAT) has completed a brief "over the shoulder" review of ongoing silos project design efforts as a follow-up to the CAT's September review of Fluor and Jacobs efforts. This report documents the findings of this review.

The Jacobs engineering team is producing quality engineering documentation. While the CAT has found multiple areas where there are deficiencies (listed below), the Jacobs team is provides sound engineering capabilities for the silos project.

Cost and Schedule

CAT report #23 stated:

> *Currently, the Silos 1 and 2 schedule is not a useful document. It does not contain a critical path, interim milestones or sequential logic. Personnel responsible for each task should identify work logic and then estimate schedules with interim milestones and resource requirements. These estimates are then rolled-up to the project master schedule and cost estimate. It currently appears that the schedules and cost estimate are not being created in this bottoms-up approach but are rather created from the top-down.*

The scheduling documentation for Silo 3 has matured into a useful document. The schedule for Silos 1 and 2 does not yet contain a clear logic and all project activities (e.g. Duratek activities) are not identified on the schedule. In addition, management and integration of these Duratek activities appears diffuse and is difficult to track.

The project Earned Value Management System has improved over the last CAT visit but is not yet fully implemented.

Project master schedules are not being prepared through a roll-up of the sub-project task schedules. Rather, these are separate efforts that are being integrated through task titles and milestones.

Compliance with Engineering Execution Plan (EEP)

In its brief review, the CAT noted areas where silos projects are not in compliance with the EEP. Silo 3, while generally utilizing the EEP to drive design deliverable activities, is not reporting progress according to the EEP. The EEP requires 0-70%, 80%, and 90% graded progress reporting for activities longer than three months. Silo 3, however, is using a 50/50 reporting approach for conceptual design. Jacobs acknowledged that the 50/50 method is not resulting in accurate reporting data and will therefore not be using it in the future.

Silos 1 and 2 is not in compliance with the EEP due to Conceptual Design documentation being moved into the Preliminary Design package and the CAT has not been presented project documentation of this change.

Technical Approach

Overall, the Silo 3 design effort appears to be proceeding apace and will likely meet its schedule for Conceptual Design with an acceptable design package.

Currently, all three silos projects facilities designs assume multiple startup and shut down processes each week. This may not be the best economic or processing approach. As all three silos projects progress, it is critical that facilities are designed consistent with Fernald's operating assumptions. To ensure such consistency, Fluor Fernald should: (1) conduct optimization evaluations to ensure the silos facilities operations approach is economically and technically sound; (2) document it's preferred operations approach for each project; and (3) revise each project's basis of design accordingly.

The Silos 1 and 2 schedule is in jeopardy, particularly because the Conceptual Design deliverables have been added to the Preliminary Design package due in April 2002. The project is still pursuing alternatives studies (e.g. intermodal shipping) that divert effort away from meeting the design schedule. The schedule slippage (presently estimated as 6 weeks) may be acceptable—provided the preliminary design deliverables are of sufficient quality and the 3-D design effort yields the anticipated results.

To maintain progress and prevent further schedule slippage, the Silos 1 and 2 project is facing multiple near-term decisions (e.g. transportation, canister, formulation). Without proactive movement to finalize decisions, the project schedule will likely be significantly delayed.

In report #23, the CAT stated:

> *The importance of remote systems mock-up, demonstration and testing before completing final design and initiating procurement cannot be overemphasized. This activity is fundamental to the ultimate success of this project. Mock-ups and demonstrations must simulate actual work conditions including operations and maintenance, protective clothing, breathing air, etc.*

Remote remains a significant challenge for both projects Silos 1 and 2 and Silo 3. It does not appear to be receiving adequate emphasis. Mock-up, testing and redesign of the Silos 1 and 2 fill system, fill head and laser guided positioning systems are not identified on the schedule and activities to support remote development are unlikely to be completed prior to the issuance of the Preliminary Design package in April, 2002. The CAT reemphasizes its recommended pursuance of these activities for integration into the design effort (CAT Report #23).

Silo 3 also has remote challenges that need attention. Of most importance is the development of an approach to cutting the side of the silo, removing, placement and disposal of the concrete debris and initiating retrieval. Both Silo 3 and Silos 1 and 2 will require time and motion studies to better understand materials handling capabilities.

In addition to personnel radiation exposure issues facing Silo 3 and Silos 1 and 2, both projects will need to focus attention on contamination control issues.

Several areas of the Silos 1 and 2 design effort seem to be utilizing different solids loading assumptions. The solids loading assumptions should be outlined in the design basis so that processing, vessel sizing and shielding parameters are designed consistently and conservatively.

The CAT is also concerned about the project documentation aspect of the teaming partner approach. Fluor must ensure that meeting minutes are taken and distributed and that action items with responsible parties are identified and tracked to closure.

Recommendations

RECOMMENDATION 24-1: DOE should conduct a Quality Assurance audit of the Engineering Execution Plan to ensure that both Fluor Fernald and Jacobs are in compliance.

RECOMMENDATION 24-2: Fluor Fernald should: (1) conduct optimization evaluations to ensure the silos facilities operations approach is economically and technically sound; (2) document the preferred operations approach for each project; and (3) revise each project's basis of design accordingly.

RECOMMENDATION 24-3: Fluor should set a schedule for completion of the DCN process for AWR. The CAT is concerned that, without a project focus, the DCN process has the potential to extend indefinitely, significantly impacting project schedule.